# THE STATUS OF THE KIRTLAND'S WARBLER

# (*Dendroica kirtlandii* (Baird))

# IN CANADA

by

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Prepared for the

Committee on the Status of Endangered

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ABSTRACT

The Kirtland's warbler (Dendroica kirtlandii (Baird)) is one of the world's most critically endangered birds. It is known to breed only in the northern part of the Lower Peninsula of Michigan. However, Paul Harrington (1939) observed singing males 'regularly' and over a fairly large area in 1916 in the Petawawa Military Camp, Ontario and observed individuals again in 1939 (Harrington, 1939) and twice in 1946 (Harrington, 1943-51). In view of Harrington's observations, it became evident that a breeding population might be located in Canada.

In 1977, a singing male was found near Petawawa, Ontario. In 1978, the same bird was re-located near Petawawa and another was found in Quebec.

The species has undergone a continuous decline and probably faces extirpation in Canada. It is protected by the Migratory Birds Convention Act and endangered species legislation in Ontario and the United States. Habitat loss, cowbird parasitism and as yet unidentified factors during migration and/or on the wintering grounds have reduced the size of the population. A thorough census should be conducted of all areas in Canada having a high potential for occupation by this species. Management programs should be considered for the areas warranting them. The bird should be classified as endangered in Canada.

## DISTRIBUTION

The Kirtland's warbler was discovered and classified in 1851 but it was 1903 before the breeding grounds were located in the northern part of the Lower Peninsula of Michigan (Mayfield, 1960). This region, centred around Crawford, Ogemaw and Oscoda counties, is presently the only known breeding area in the world. Although sight records have occurred elsewhere in the United States and Canada, no evidence of breeding has been confirmed. In 1879, the species' wintering grounds were found in the Bahama Islands (Mayfield, 1960).

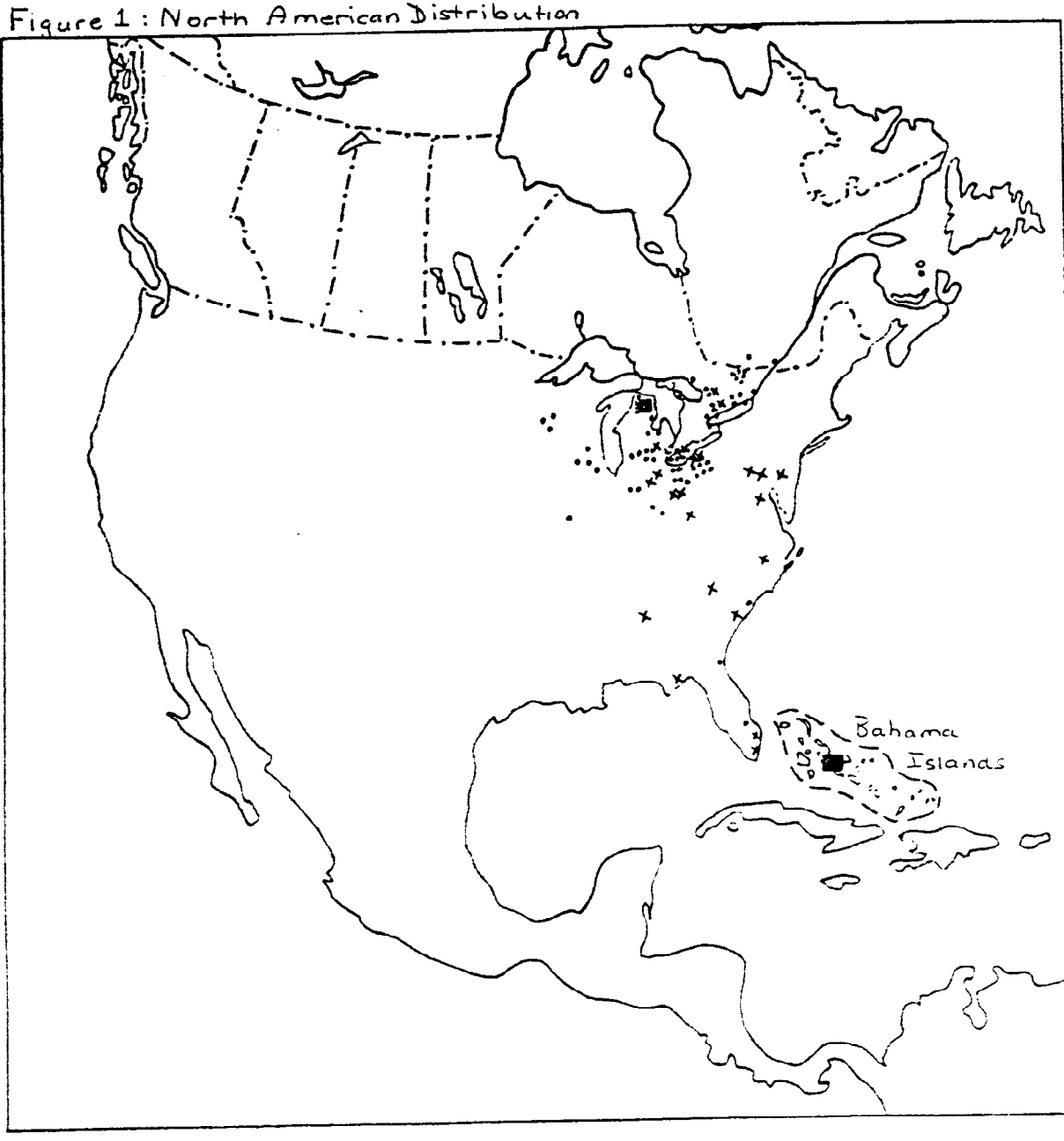
Byelich (1976) states that it is presumed that the bird formerly nested "...in the conifer zone on the sandy outwash plains in the wake of the Wisconsin Ice Sheet." This zone was a comparatively narrow strip across the north central United States, and the amount of suitabl habitat available to the warbler at any one time probably was limited.

Figure 1 indicates spring and fall sight records in the United States outside of Michigan. Two lone males were discovered near Black River Falls, Wisconsin during surveys conducted in June, 1978.

Since 1900, 30 sightings of Kirtland's warblers have been recorded in Canada (See Appendix A and Figure 1), all in the area from Point Pelee (Ontario) to Tobermory (Ontario) to the Gatineau River (Quebec) to Montreal (Quebec) with the exception of a record from Manitoba. At the time this report was drafted, only one record was available for Manitoba. It was supplied by the National Museum of Natural Sciences, Ottawa.

A literature review undertaken by Paul Aird (University of Toronto has suggested that the bird was a regular breeder in [illegible] Petawawa

Figure 1 : North American Distribution




Sight Records 1879 - 1978

• Spring and Summer

× Fall

■ Michigan Breeding Ground

◉ Wintering Grounds - Baha
Islan

Military Camp, Ontario (Harrington, 1939). A search of the Camp undertaken by Aird, et al., during the 1977 breeding season located one singing male although no female or nest was found.

This bird was captured and colour-banded by a team from the Ontario Ministry of Natural Resources and the United States Kirtland's Warbler Recovery Team. Results of a chemical analysis, undertaken by the Ohio State University of a feather sample, suggests that the Petawawa bird is from a distinct sub-population that has either wintered, summered or both in a region substantially different from the Michigan birds (Peterle, 1977).

On June 2, 1978, Paul Aird (University of Toronto) and Jacques Bouvier, of Algonquin College, re-located the same individual at Camp Petawawa that was discovered there in 1977. Aird also located a singi male north of Ottawa, near the Gatineau River, Quebec, on May 27, that had been banded, as a nestling, four years previously in Michigan.

In 1978, 150 sites of potentially suitable habitat in central Ontario ($45^{o}00'$ to $46^{o}15'$N and $76^{o}30'$ to $81^{o}00'$W) were surveyed by the Ontario Kirtland's Warbler Work Group (See Figure 2). Participant were the Ontario Ministry of Natural Resources, the Canadian Wildlife Service, the Royal Ontario Museum, the University of Toronto and volunteers. Although sites of apparently suitable habitat were present no warblers were found.

## POPULATION SIZE AND TREND

Census results in Michigan during 1978 indicated 193 singing, territorial males compared to 502 singing males in 1961 (Michigan DNR, 1978), a dramatic decline. The total world population is

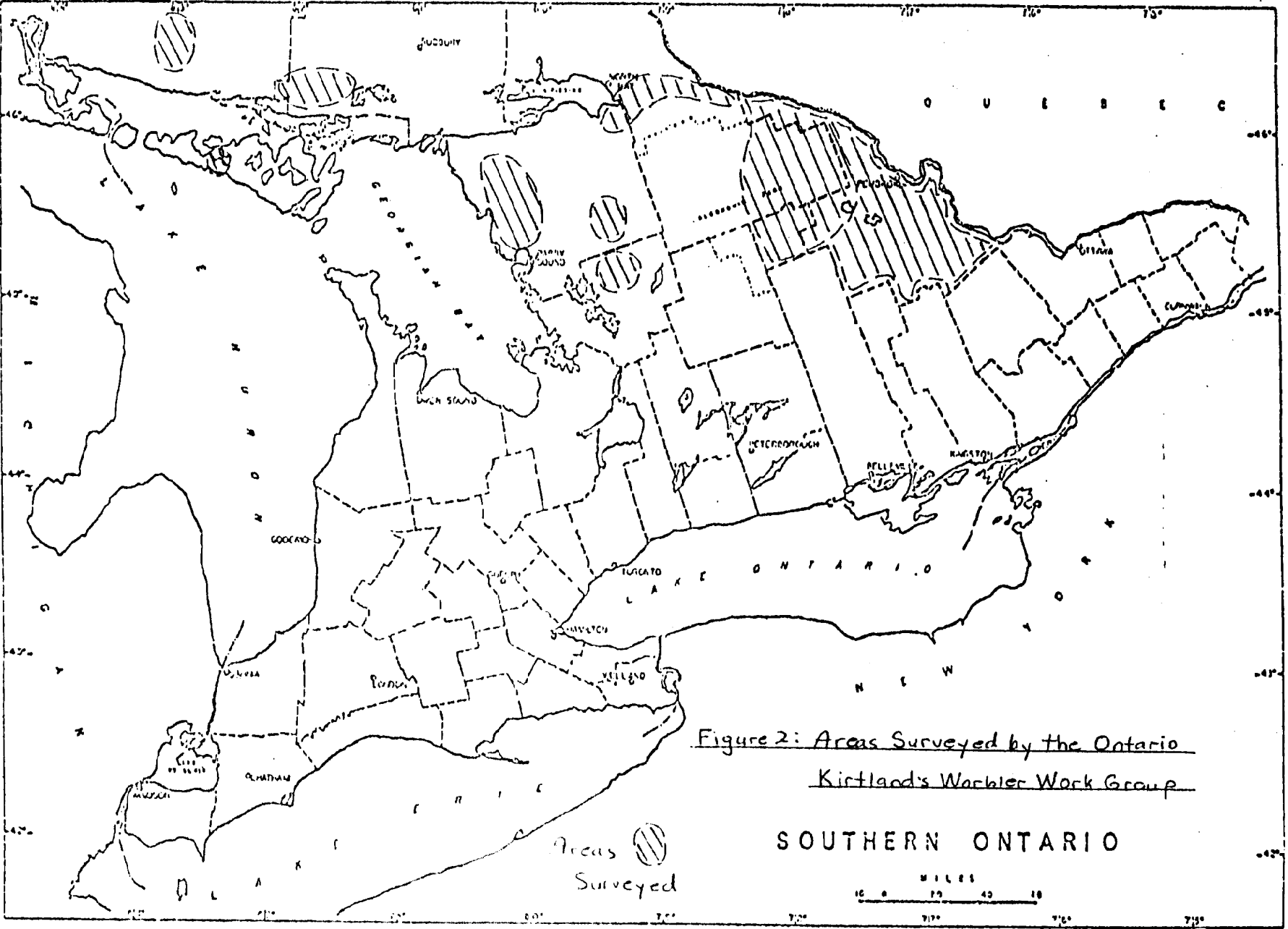



Figure 2: Areas Surveyed by the Ontario Kirtland's Warbler Work Group

presently estimated to be just under 400 individuals (Michigan DNR, 1978). The number of singing males increased slowly between 1974 and 1977 (See Table 1) but decreased in 1978.

Table 1: Numbers of Singing Males in Michigan (Ryel, 1978)

| Year | 1951 | 1961 | 1971 | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 |
|---|---|---|---|---|---|---|---|---|---|---|
| Number | 432 | 502 | 201 | 200 | 216 | 167 | 179 | 200 | 218 | 193 |

Including the 4 males found outside of Michigan, the 1978 total was 197 males which "...matches the average of the counts for the previous seven springs" (Michigan DNR, 1978). At the present time "...the bird seems to be holding its own" according to Lawrence Ryel, Chief of the Michigan Department of Natural Resources, Surveys and Statistical Services Office (Michigan DNR, 1978).

The rate of successful fledging in Michigan was critically reduced owing to severe cowbird (Molothrus ater Boddaert) parasitism. Extensive trapping to control cowbird parasitism was undertaken in 1972. The percentage of nests parasitized dropped from the 60 to 70 percent in the pre-control period to less than five percent following the introduction of the control program (Mayfield, 1977). The number of nestlings fledged per pair has also increased to a more satisfactory level (See Table 2).

Table 2: Average Number of Nestlings Fledged Per Pair, 1951-1976 (Walkinshaw, 1977)

| | No Cowbird Control | | | Cowbird Control | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1951 | 1961 | 1971 | 1972 | 1973 | 1974 | 1975 | 197 |
| Number of Nestlings Fledged Per Pair | 1.50 | 1.00 | 0.807 | 2.72 | 2.71 | 2.77 | 2.82 | 3.2 |
| | E | E | A | | | | | |

It is difficult to identify a population trend for Canada, for the former status of the bird is virtually unknown. Harrington (1939) stated that in 1916 "...we considered them not uncommon ...(at the Petawawa Military Camp),...singing males were seen and heard regularly...(and) they were seen over a fairly large area." No nest was found and no attempt was made to estimate numbers. The bird was seen at Petawawa by Harrington once in 1939 (Harrington, 1939) and twice in 1946 (Harrington, 1943-51).

After an extensive search in 1977, only one singing male was found at Petawawa. In 1978, the same individual was re-located at Petawawa, Ontario and an additional male was found north of Ottawa, near the Gatineau River, Quebec. In view of these survey results, it can be concluded that the species has undergone a continuous decline and probably faces extirpation in Canada.

## PROTECTION

The Kirtland's warbler is completely protected by the Migratory Birds Convention Act and by endangered species legislation in Ontario and in the United States.

## HABITAT

The Kirtland's warbler is specialized in its habitat. It prefers even-aged jack pine (Pinus banksiana Lamb.) stands between 2 and 6 metres (6 and 20 feet) high. The stands required are characterized by dense clumps of trees interspersed with open, grassy areas (U.S. Forest Service, undated). The pine must have living branches to the ground. The soil should be well-drained sand. The ground cover

should be composed of "...low shrubs or deep-rooted perennials..." such as bracken fern (Pteridium aquilinum (L.) Kuhn), shadbushes (Amelanchier spp.), northern dwarf cherry (Prunus pumila L.), sweet fern (Comptonia peregrina (L.) Coulter), Andropogon spp., Carex spp., Solidago spp., Vaccinium spp. (Mayfield, 1960).

Prime breeding habitat is known only to exist in north-central Michigan centering around Crawford County. Extensive habitat management procedures, designed to provide optimum habitat conditions, are being used by the Michigan Department of Natural Resources and the U.S. Forest Service who act under the general advice of the Kirtland's Warbler Recovery Team. Their goal is to develop and be able to maintain 14,400 to 16,000 hectares (36,000 to 40,000 acres) of suitable nesting habitat, by 1990 (Byelich, 1976). Approximately 1,600 to 2,000 of the 4,000 to 6,000 hectares (4,000 to 5,000 of the 10,000 to 15,000 acres) available in the 1950's and 1960's are presently suitable for breeding (Byelich, 1976).

Results of the survey of central Ontario conducted by the Kirtland's Warbler Work Group have indicated that there are at least 16 sites of apparently suitable habitat. The majority of the 16 were in the vicinity of Petawawa, Ontario. Neither these sites nor the ones where the two individual males were located in 1978 were prime breeding habitat by Michigan standards. The males were found on 'territory' in trees much taller than the 6 metre (20 foot) trees considered to be the last stages of prime habitat in Michigan.

Military operations at Petawawa have caused a succession of age stands but no manipulation has occurred to provide preferred habitat for the species. Although a large area of potential habitat is

owned by the federal government at Petawawa, it must be considered unprotected. Military manoeuvres are undertaken throughout the area and the Canadian Forestry Service in their operations do not consider the requirements of the warbler.

Sight records for 1916, 1939, 1946, 1977 and 1978 suggest the continued existence of the bird at the Petawawa site. The one bird located in 1977 and re-located in 1978 plus the one found near the Gatineau River, Quebec, do not warrant the implementation of extensive management practices at this time. If other birds are located, a management program should be considered and discussions entered into with the military and forestry service. Critical habitat, when found could possibly be protected if the agencies utilizing the land were agreeable to modify their operations to reflect the needs of the bird.

## GENERAL BIOLOGY

Nothing is known about the biology of the Kirtland's warbler population in Canada, if indeed one can describe its Canadian status as a population. The bird, however, has been well studied in Michigan (Mayfield, 1960).

According to Mayfield (1960) five eggs are usually laid in the first set and four in replacement sets. The earliest known completion date for a clutch was May 26 and the latest was July 7. Incubation of the eggs may take from 13 to 16 days.

The Kirtland's warbler tends to nest in loose 'colonies' (Mayfield, 1960). The nest is constructed "...mostly of dead leaves of sedges and grass,...lined with fine vegetable fibres and sometimes deer hair...(and is placed on the ground, usually)...near the base

of a small jack pine" (Mayfield, 1960). The pine branches and ground vegetation conceal the nests.

The bird is rarely seen in migration but with only 197 singing males recorded in 1978, this is not surprising.

## LIMITING FACTORS

Two known factors have reduced the size of the population, habitat loss and cowbird parasitism. Formerly, the extensive fires in the pinelands created new breeding habitat as the older, less suitable jack pine was burned and the seed was released to regenerate the area to pine growth. "In modern times, forest fire control has reduced the total acreage and size of individual burns...(and)... forest management practices...encourage the conversion of jack pine to red pine or hardwoods..." (Byelich, 1976).

Parasitism of the nests by the brown-headed cowbird is particularly limiting since the Kirtland's warbler "...has not developed defenses against cowbird parasitism exhibited by many other songbirds" (Byelich, 1976). Management efforts in the Kirtland's warbler area in Michigan are devoted to cowbird control and forest manipulation to provide suitable jack pine stands. Similar programs should be undertaken in Canada if breeding birds are found.

It is also believed that there is an unidentified mortality factor affecting the population either during migration and/or on the wintering grounds. "Since 1972, about 1,200 warblers have gone south each fall but only 400 have been found in the census in Michigan the next June" (Byelich, 1976).

## SPECIES SIGNIFICANCE

The Kirtland's warbler has attracted widespread public and government interest because it is considered one of the world's most endangered bird species. Its status in Canada, therefore, should be thoroughly investigated.

## RECOMMENDATIONS

1. Federal and provincial authorities should cooperate to census areas having a high potential for occupation by the species.
2. Develop a joint management program between federal, provincial and American agencies for the species, should census data demonstrate that this is warranted.
3. Cooperate and liaise on an ongoing basis with the U.S. Recovery Team and respective wildlife agencies on the Kirtland's warbler.

## EVALUATION

Cowbird parasitism, habitat loss and as yet unidentified factors during migration and/or on the wintering grounds have caused this species to decline. The identification of a possible Canadian population and the undertaking of appropriate management programs, in addition to those in progress in Michigan, may result in an increase in the world population.

The bird should be classified as endangered in Canada.

ACKNOWLEDGEMENTS

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APPENDIX A

RECORDS OF THE KIRTLAND'S WARBLER IN CANADA, 1900-1978*

| Locality | Latitude (N) | Longitude (W) | Year | From Mo. | From Da. | To Mo. | To Da. | Sex | Reference |
|---|---|---|---|---|---|---|---|---|---|
| Toronto (Ont.) | | | 1900 | 05 | 16 | - | - | male | Royal Ontario Museum (ROM) specimen; Hughes (1900) Kells (1901). |
| Point Pelee (Ont.) | 41°57' | 82°31' | 1915 | 10 | 02 | - | - | male | ROM specimen. |
| Petawawa (Ont.) | 45°58' | 77°22' | 1916 | 06 | 04 | 07 | 12 | male | Paul Harrington 1914-1924 fieldnotes and F.A. Starr fieldnotes, ROM Library; Harrington (1939). |
| L. Winnipegosis (Manitoba) | | | 1921 | 08 | 03 | - | - | | Taverner (1921). |
| Petawawa | 45°58' | 77°22' | 1939 | 06 | 05 | - | - | male | Paul Harrington 1930-1941 fieldnotes, ROM Library; Harrington (1939). |
| Long Point (Ont.) | 42°36' | 80°24' | 1941 | 08 | 31 | - | - | male | Letters from H. A. Sivyer to J. L. Baillie, ROM files |
| Barrie (Ont.) | 44°24' | 79°33' | 1945 | 08 | 09 | 08 | 13 | female<br>male<br>2 juv. | The Kirtland's Warbler file of Doris H. Spiers, Pickering. |
| Petawawa | 45°58' | 77°22' | 1946 | 06 | 18 | - | - | male | Paul Harrington 1943-51 fieldnotes, ROM Library. |
| Petawawa | 45°58' | 77°22' | 1946 | 07 | 27 | - | - | male | Paul Harrington 1943-51 fieldnotes, ROM Library. |
| Toronto | | | 1947 | 05 | 30 | - | - | | ROM Kirtland's Warbler (KW) file. |
| Pickering (Ont.) | | | 1948 | 09 | 14 | - | - | | Doris H. Spiers, Pickering, personal communication. |
| Point Pelee | 41°57' | 82°31' | 1953 | 05 | 10 | - | - | | Baillie, J. L. 1953 Audubon Field Notes 7(4):271. |
| Toronto | | | 1958 | 05 | 16 | 05 | 20 | | Baillie, J. L., Journals, Fisher Rare Book Library, University of Toronto; Gunn (1958). |
| Tobermory (Ont.) | 45°08' | 81°29' | 1958 | 06 | 08 | 06 | 30 | male | Baillie, J. L., Journals, Fisher Rare Book Library, University of Toronto; Gunn (1958) |
| Point Pelee | 41°57' | 82°31' | 1959 | 05 | 10 | - | - | male | Woodford, James 1959 Bird Banding 30:234. |
| Toronto | | | 1959 | 05 | 24 | - | - | male | Baillie, J. L., Journals, Fisher Rare Book Library, University of Toronto. |
| Hamilton (Ont.) | | | 1960 | 06 | 17 | - | - | male | Burton and Woodford (1960). |
| Point Pelee | 41°57' | 82°31' | 1961 | 05 | 13 | - | - | | ROM photograph; ROM KW file; Woodford and Burton (1961); Woodford (1961). |

Appendix A (continued)

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Parry Sound (Ont.) | 45°36' | 80°23' | 1961 | 06 | 17 | - | - | male | ROM photographs; ROM skeleton; Woodford (1961). |
| Picton (Ont.) | 43°56' | 76°53' | 1962 | 05 | 19 | - | - | | Sprague, I. 1969 Birds of Prince Edward County, Picton Gazette Publishing Company. |
| Whitby (Ont.) | | | 1962 | 05 | 19 | - | - | | Goodwin, C. E. 1963 Ontario Naturalist 1(3):23-26. |
| Whitby | | | 1963 | 06 | 01 | - | - | | Goodwin, C. E. 1963 Ontario Naturalist 1(3):23-26. |
| Rice Lake (Ont.) | 44°07' | 78°14' | 1963 | 07 | 02 | - | - | male | Brodie Club Minutes, Meeting #617, ROM. |
| Kingston (Ont.) | 44°14' | 76°52' | 1964 | 05 | 12 | - | - | | Sprague, I. 1969 Birds of Prince Edward County, Picton Gazette Publishing Company. |
| Barrie | 44°30' | 79°30' | 1964 | 05 | 16 | 05 | 20 | male | ROM photographs; Devitt, O. E. 1967 The Birds of Simcoe County, Ontario. |
| Barrie | | | 1967 | 05 | 19 | - | - | | Devitt, O. E. 1967 The Birds of Simcoe County, Ontario |
| Petawawa | 45°58' | 77°22' | 1977 | 06 | 09 | 07 | 14 | male | KW file, Faculty of Forestry and Landscape Architectur University of Toronto. |
| Montreal (Que.) | 45°30' | 73°36' | 1977 | 08 | 08 | - | - | | Province of Quebec Society for the Protection of Birds Newsletter 20(4), 1977. |
| Petawawa | 45°58' | 77°22' | 1978 | 06 | 02 | | | male | KW file, Faculty of Forestry and Landscape Architectur University of Toronto. |
| Gatineau (Que.) | | | 1978 | 05 | 27 | | | male | KW file, Faculty of Forestry and Landscape Architectur University of Toronto. |

*Many of the records included in this list were supplied by Dr. Paul Aird, of the University of Toronto. This list